Activity Title:
Save the Fish/Fish the Fish: A Marine Policy Debate

Subject (Focus/Topic):
Considers the science and ethics behind fisheries policy.

Grade Level:
University

Average Learning Time:
75 minutes

Lesson Summary (Overview/Purpose):
Students are divided into groups and assigned a fish species that is or has been at risk for overfishing, and asked to put together a policy strategy that will allow for the economic livelihood of fishers and fish consumers while still providing protection for the fish.

Overall Concept (Big Idea/Essential Question):
Fisheries policy is a complicated tradeoff between conservation and exploitation. With many people around the world relying on fish for income and sustenance, it is difficult to agree on what protection measures are able to protect both the sustainability of the fish species without compromising the well-being of those that rely on fish.

Specific Concepts (Key Concepts):
Principles of sustainability, economic returns of fishing, marine science.

Focus Questions (Specific Questions):
Which fish are most at risk in American waters?
What can be done to save the fish?
How do protection measures impact American economic livelihoods?
How do we know when a fish no longer needs protection?
And can we singlehandedly protect a fish species when these fish share waters with countries other than our own?

Objectives/Learning Goals:
Students will break into groups of 5-6 and be assigned a one page summary of a particular marine species (for example, swordfish, Bluefin tuna, etc). They will consider the facts on this sheet, which include an overview of how protected the species currently is, what marine biologists claim about its risk status, whether it is a lucrative and/or widely fished species, and any other information related to that species's individual characteristics or risk. Students may supplement this information by looking information up on NOAA's website to learn more about their assigned species. Having considered the information they've learned about a particular fish, students will consider what the appropriate level of protection the fish needs, if any, and the best way to provide that protection (fishing licenses, forbidding trade of a fish species, monitoring fish populations, etc). Students will,

at the end of approximately 45 minutes of discussion, regroup as a class to talk about their particular fish species and the protection measures they determined as a group.

Background Information:
Students will need a fact sheet to get started with their marine species, as few students in the social sciences are well versed in fisheries biology. They will also need to know basic economic information – is this a subsistence fish, a fish that sells for a high price, etc. If students are not from a coastal community, they may need a short discussion about fisheries management practices (note that in the coastal areas where I have taught, this is generally not needed as enough students are already aware of basic regulatory practices and usually discuss these issues in their groups with less knowledgeable peers).

Common Misconceptions/Preconceptions:
Most students have not thought overly much about fisheries policy, so generally there is a blank slate. However, I teach political science students, so they understand policy making in general – your mileage may vary there. Be prepared to answer basic questions, and offer a period before the exercise to allow students to ask these questions. Occasionally a student who is extensively involved in fishing will offer their experiences, but be sure to distinguish between state level policies and federal or international level policies, since students usually fail to recognize the differences there.

Materials:
Activity fact sheets for students. If you want to allow them to look up additional information, access to a computer or smart phone is needed. Students may provide these themselves or the activity could be held in a computer lab if necessary.

Technical Requirements:
Internet accessible devices, if the instructor deems necessary.

Teacher Preparation:
Teachers must prepare the fact sheets in advance. Class preparation one lesson before on general issues of marine policy and economics, as well as sustainability, will set the stage for the exercise. A short time for questions after giving the directions for the exercise, but before they begin it, is a good plan.

Keywords:
The names of their individual fish species, names of international conservation policy organizations.

Pre-assessment Strategy/Anticipatory Set (Optional):
As stated above, I usually do a lesson the day prior to the exercise that speaks in general to ocean conservation and law, as well as basic sustainability practices.

Lesson Procedure:

1. Teach a lesson the day before on general ocean policy issues – I usually cover a brief overview of UNCLOS and the FAO data on overfishing in their annual Fisheries and Aquaculture Report, using the most recent issue of that. At the end of class, tell them that there will be an activity on marine policy the following class.
2. Select marine species for use in the exercise. I usually focus on fish but throw in other marine species as well (whales, mollusks, etc), to match local fish and interests.
3. Create fact sheets for each selected species. Since I usually teach a class of 20-25 students, I create between 4-5 sheets to allow for groups of 5.
4. The day of the lesson, announce in class that there will be a group activity. Tell them that they will be broken into groups and given information about a marine species, and that each group will have a different species. They then should be instructed to consider the information on their fact sheet (plus any other information they learn, if you allow for internet research), and select what they think is the best policy to protect both the fish and the economic livelihood of those dependent on that fish. They will have approximately 45 minutes to discuss in groups, and then the class will meet back as a whole to talk about their species as well as their conclusions.
5. Monitor the discussions to make sure that the students stay on track – especially important if you allow electronic devices. Many will have questions that come up organically during their discussions, and will ask if you come stand by them. Listen to the discussions and contribute only if it seems that students are missing or confused about the factual information.
6. Announce 5 minutes prior to the end of group discussion that they need to wrap up their conversation. Inevitably one group will be finished and one won't, so they need this warning.
7. Ask each group in turn to discuss their fish (they usually just read their fact sheet aloud, so be sure to keep those sheets short and pithy!). Then ask them what their policy recommendations are, and why they arrived at those options.
8. In the remaining time, have the students challenge and respond to each others' policies.

Assessment and Evaluation:
Students will be graded on their participation in this exercise. In my classes, participation is a separate grade for these students, and exercises like these can help encourage shyer students to contribute. Observation of the student groups will help you identify if everyone is participating, and when it seems that someone is being left out, they can be asked directly for their thoughts. The course where I utilize this exercise has preset essay exams, and they could be asked an essay question about the material covered.

Standards:
Students are expected to show that they are familiar with the basic questions behind the formation of maritime policy.

National Science Education Standard(s) Addressed:
NA

Ocean Literacy Principles Addressed:

This lesson plan addresses Principle 6 (the ocean and humans are inextricably interconnected).

State Science Standard(s) Addressed:
NA

Additional Resources:
Websites:
NOAA FishWatch: http://www.fishwatch.gov/
IUCN RedList: http://www.iucnredlist.org/

Books:
Elizabeth DeSombre and Samuel Barkin. 2011. *Fish*. Great Britain: Polity Press.

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